

CLAIMS:

1. A seismic acquisition system, comprising:
a plurality of seismic data sources capable of generating data;
at least one data collection system utilizing an open network protocol; and
at least one line network connecting the data sources to the data collection system and
utilizing an open network protocol, the line network including:
a plurality of data source nodes at which a portion of the plurality of seismic
data sources are respectively attached to the line network; and
a router for routing data generated by the seismic data sources to the data
collection system through the data source nodes in accordance with the
open network protocol.
2. The seismic acquisition system of claim 1, wherein the router routes data to
the seismic data sources.
3. The seismic acquisition system of claim 1, wherein each of the data source
nodes is assigned at least two respective network addresses under the open network protocol.
4. The seismic acquisition system of claim 1, further comprising at least one
additional router for routing data generated by the seismic data sources to the data collection
system through the data source nodes in accordance with the open network protocol.
5. The seismic acquisition system of claim 1, wherein the data collection system
is assigned at least two respective network addresses under the open network protocol.
6. The seismic acquisition system of claim 1, wherein the seismic cable
comprises a land-based seismic cable or an ocean bottom cable.
7. The seismic acquisition system of claim 1, wherein the seismic data sources
include at least one of seismic sources, seismic receivers, and positioning instruments.
8. The seismic acquisition system of claim 7, where in the seismic sources
include at least one of an air gun, a vibrator, and an explosive charge.
9. The seismic acquisition system of claim 7, wherein the seismic receivers
include at least one of a hydrophone and a geophone.

10. The seismic acquisition system of claim 1, wherein the open network protocol includes the Internet Protocol.

11. The seismic acquisition system of claim 10, further comprising a synchronization service.

12. The seismic acquisition system of claim 11, wherein the synchronization service comprises the Network Time Protocol.

13. The seismic acquisition system of claim 1, wherein the at least one data collection system further administers at least one of:

a synchronization service synchronizing a plurality of clocks for the data collection system, the router, the data source nodes, and the seismic data sources;

a location mapping service for mapping between network addresses and logical locations of the data collection system, the router, the data source nodes, and the seismic data sources; and

an auto-configuration capability for automatically reconfiguring the network upon removal of any one of the router, the data source nodes, or the seismic data sources, or upon the addition of an additional piece of seismic equipment.

14. The seismic acquisition system of claim 13, wherein the synchronization service comprises the Network Time Protocol.

15. The seismic acquisition network of claim 13, wherein the synchronization service tolerates changes in topology.

16. The seismic acquisition system of claim 13, wherein the synchronization service synchronizes the clocks hierarchically.

17. The seismic acquisition network of claim 13, wherein the synchronization service tolerates breaks in the attachment between at least one seismic data source and the line network.

18. The seismic acquisition system of claim 13, wherein the location mapping service maps:

an order for the data collection system, the router, the data source nodes, and the seismic data sources;
an orientation for each of the data collection system, the router, the data source nodes, and the seismic data sources; and
a plurality of topology events.

19. The seismic acquisition system of claim 18, wherein the topology events include at least one of a link going up, a link going down, and a node address change.

20. The seismic acquisition system of claim 13, wherein the at least one data collection system comprises a plurality of data collection systems and the synchronization service, the location mapping service, and the auto-configuration capability are administered by more than one of the plurality of data collection systems.

21. A method for use in a seismic survey, the method comprising:
assigning at least two respective network addresses to each one of a plurality of seismic data sources, a plurality of data source nodes, a plurality of routers, and a data collection system;
routing data generated by the data sources through the data source nodes and the routers to the data collection system;
correlating the network addresses of the seismic data sources to the physical location of the respective seismic data sources; and
correlating the physical locations of the respective seismic data sources to the data generated by the respective seismic data sources.

22. The method of claim 21, wherein assigning the at least two respective network addresses to each one of a plurality of seismic data sources includes assigning at least two respective network addresses to each one of a plurality of seismic data sources including at least one of a seismic source, a seismic receiver, and a positioning instrument.

23. The method of claim 21, further comprising at least one of:
synchronizing a plurality of clocks for the data collection system, the router, the data source nodes, and the seismic data sources;
mapping between network addresses and logical locations of the data collection system, the router, the data source nodes, and the seismic data sources; and

automatically reconfiguring the network upon removal of any one of the router, the data source nodes, or the seismic data sources, or upon the addition of an additional piece of seismic equipment.

24. The method of claim 23, wherein synchronizing the plurality of clocks includes synchronizing the clocks hierarchically.

25. The method of claim 23, wherein mapping between network addresses and logical locations of the data collection system includes:

mapping an order for the data collection system, the router, the data source nodes, and the seismic data sources;

mapping an orientation for each of the data collection system, the router, the data source nodes, and the seismic data sources; and

mapping a plurality of topology events.